CLAIMS

What is claimed is:

1. An algebraic codebook method for distributions of P signed pulses on N positions, comprising:

(a) indexing all distributions of P signed pulses on N positions by ordering said distributions in terms of numbers of distributions of Q pulses on M positions for Q less than P, M less than or equal to N, and without regard to the sign of any pulses at the Mth position, where P, N, Q, and M are non-negative integers.

2. The method of claim 1 wherein:

(a) each of said N positions containing at least one of said P pulses corresponds to said numbers of distributions of Q pulses on M positions for a single value of Q.

3. An algebraic codebook method for distributions of P signed pulses on N positions, comprising:

(a) computing a codebook index for a distribution of P signed pulses on N positions by summing a pulse index for each non-overlapping pulse with each said pulse index a sum of terms $XK(M,Q)$ where X is a multiplier equal to 0, 1, or 2 and $K(M,Q)$ is the numbers of distributions of Q signed pulses on M positions without regard to the sign of any pulses at the Mth position, where P, N, Q, and M are non-negative integers.

4. An algebraic codebook method for distributions of P signed pulses on N positions, comprising:

(a) providing a codebook index I_{CB} where I_{CB} is a sum of one or more pulse indexes with each pulse index corresponding to a position occupied by one or more pulses of a distribution of P signed pulses on N positions, wherein each pulse index is a sum with respect to M of one or more terms $XK(M,Q)$ where X is

a multiplier equal to 0, 1, or 2 and $K(M,Q)$ is the number of distributions of Q signed pulses on M positions without regard to the sign of any pulses at the Mth position, and wherein P, N, Q, and M are non-negative integers;

(b) computing a distribution of P signed pulses on N positions from said codebook index I_{CB} by successively extracting each of said pulse indexes from I_{CB} where a pulse index is computed by accumulating $XK(M,Q)$ for M decreasing from a location determined by the extraction of the immediately prior pulse index, said accumulating continuing until equaling or exceeding I_{CB} minus the prior extracted pulse indexes.